

degrees F. and 72 degrees F. Similar results were obtained when the thickness was not reduced in the central area, but rather a reduced width of $w_{sage}=0.500$ inches was machined in the central area 54 as depicted in FIG. 5(b).

A round bar type design of the breakaway link of FIG. 4 was prepared from Hydrex 4101 material available from A.L. Hyde Co. The Hydrex round stock was 1 inch in diameter and was cut to a 4 inch length. This piece was then machined to have two holes to connect the fishing lines, said holes being 0.50 inches in diameter and each hole was located 1/2 inch from an end of the round stock piece. A region 43 of reduced diameter, $D_{sage}=0.342$ inches, was machined between the holes using a radius of curvature, $k=0.500$ inches, as depicted in FIG. 4. This reduced diameter connection or isthmus 43 served as the location for the designed failure of the link device. This breakaway link embodiment exhibited a terminal load point of approximately 1075 pounds when monotonically stretched in tension to failure in an Instron Model 1322 mechanical testing systems, at temperatures of approximately 32 degrees F and 72 degrees F.

In a similar manner, round stock rods of Hydrex or other engineering plastic, composite materials, laminates, flexible metals, and the like can be machined to have larger or smaller values of D_{sage} for the "weakening" effect to create corresponding larger or smaller tensile failure load points. For example, if $D_{sage}=0.404$ inches is used rather than 0.342 inches, the tensile failure load point would be approximately 1500 pounds, and if $D_{sage}=0.171$ inches is used instead, the tensile failure load point would be approximately 270 pounds.

It is therefore clear that the present invention provides devices which can be engineered to possess designed performance characteristics including tensile failure load points. This is highly desired in the fishing industries to minimize or eliminate the problem of whale entanglement in underwater gear.

While the invention has been disclosed in this patent application by reference to the details of preferred embodiments and examples of the invention, it is to be understood that this disclosure is intended in an illustrative rather than in a limiting sense, as it is contemplated that modifications will readily occur to those skilled in the art, and such modifications by the skilled artisan are within the spirit of the invention and the scope of the claims which follow. Various modifications may be adopted without departing from the literal scope. Equivalent structures and structural equivalents are clearly contemplated as within the scope of the disclosed and claimed invention.

That which is claimed is:

1. A method to reduce the injury to whales or other cetaceans entangled in underwater gear, said method comprising (a) incorporating into said gear at least one breakaway link that exhibits calculated material failure, (b) entangling a whale or other cetacean in said gear, (c) release of said whale or cetacean upon the administration to said link of a load generated by the struggling of said entangled whale or cetacean.